

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1 1. (currently amended) An electromagnetic interference
2 analysis method for analyzing the amount of electromagnetic
3 interference arising in an LSI by means of performing a gate
4 level logic simulation, the method comprising:
5 an instantaneous current amount calculation step of
6 calculating the amount of instantaneous electric
7 current from event information, the information
8 being produced when a change arises in a signal and
9 including the instance name of each cell in which
10 the change has arisen, the name of the signal, a
11 time at which the change has arisen, and transition
12 information;
13 a ~~modeling~~ transforming step of ~~modeling~~ transforming
14 said instantaneous current amount into an the
15 instantaneous electric current according to a
16 predetermined rule related to said instantaneous
17 current amount; and
18 an FFT processing step of subjecting to fast Fourier
19 processing (hereinafter referred to as "FFT
20 processing") the information concerning a change in
21 electric current, the information being calculated
22 through the transforming ~~modeling~~ step.

1 2. (original) The electromagnetic interference analysis
2 method as defined in claim 1, wherein the modeling step
3 includes an averaging step of averaging the instantaneous
4 current over a certain discrete width, and the FFT processing
5 step includes a step of subjecting to FFT processing
6 information concerning a change in current, the information

7 being produced by the averaging step.

1 3. (previously presented) The electromagnetic
2 interference analysis method as defined in claim 1
3 wherein the modeling step includes a rectangular waveform
4 modeling step of modeling the instantaneous current
5 as a rectangular waveform whose height is calculated
6 from information for each event such that the area
7 of the rectangular waveform becomes equal to the
8 amount of electric current of each event
9 and the FFT processing step includes a step of subjecting
10 to FFT processing information concerning a change in
11 current, the information being calculated in the
12 rectangular waveform modeling step.

1 4. (original) The electromagnetic interference analysis
2 method as defined in claim 1, wherein the modeling step
3 includes a geometrically-similar rectangular waveform modeling
4 step of modeling the instantaneous current as a geometrically-
5 similar rectangular waveform whose height and width are
6 calculated such that the area of the rectangular waveform
7 becomes equal to the amount of electric current of each event,
8 and the FFT processing step includes a step of subjecting to
9 FFT processing information concerning a change in current, the
10 information being calculated in the geometrically-similar
11 rectangular waveform modeling step.

1 5. (previously presented) The electromagnetic
2 interference analysis method as defined in claim 1, wherein
3 the modeling step includes a rectangular waveform modeling
4 step of calculating the instantaneous electric current from
5 each event information, and a step of modeling the
6 instantaneous current as a rectangular waveform through use of
7 the amount of electric current and a table representing the

8 relationship between the width and height of a rectangular
9 waveform, to thereby subject to FFT processing the information
10 concerning a change in electric current calculated in the
11 rectangular waveform modeling step.

1 6. (previously presented) The electromagnetic
2 interference analysis method as defined in claim 1, wherein
3 the modeling step includes a step of calculating the
4 instantaneous electric current from information for each
5 event, and a rectangular waveform modeling step of modeling
6 the instantaneous current as a rectangular waveform through
7 use of a slew in input waveform and a table representing the
8 relationship between the width and height of a rectangular
9 waveform, to thereby subject to FFT processing the information
10 concerning a change in electric current calculated in the
11 rectangular waveform modeling step.

1 7. (previously presented) The electromagnetic
2 interference analysis method as defined in claim 1, wherein
3 the modeling step includes a step of calculating the
4 instantaneous electric current from information for each
5 event, and a rectangular waveform modeling step of modeling
6 the instantaneous current as a rectangular waveform through
7 use of an output load capacitance and a table representing the
8 relationship between the width and height of a rectangular
9 waveform, to thereby subject to FFT processing the information
10 concerning a change in electric current calculated in the
11 rectangular waveform modeling step.

1 8. (previously presented) The electromagnetic
2 interference analysis method as defined in claim 1, wherein
3 the modeling step includes a step of calculating a drop in
4 voltage from the amount of electric current flowing in each
5 cell and the resistance of a power line and correcting the

6 amount of instantaneous electric current of each cell for each
7 event, on the basis of the relationship between the drop in
8 voltage and the amount of instantaneous electric current.

1 9. (original) The electromagnetic interference analysis
2 method as defined in claim 1, wherein the modeling step
3 includes a step of calculating a drop in voltage from the
4 amount of electric current flowing in each cell, the
5 resistance of a power line, and the capacitance of an on-chip
6 capacitor, and correcting the amount of instantaneous electric
7 current of each cell for each event, on the basis of the
8 relationship between the drop in voltage and the amount of
9 instantaneous electric current.

1 10. (original) The electromagnetic interference analysis
2 method as defined in claim 1, wherein the modeling step
3 includes a step of transiently analyzing a power RC of each
4 cell and a cell power source, accurately calculating a drop in
5 voltage, and a correction step of correcting the amount of
6 instantaneous electric current of each cell for each event, on
7 the basis of the relationship between the drop in voltage and
8 the amount of instantaneous electric current.

1 11. (previously presented) The electromagnetic
2 interference analysis method as defined in claim 1, wherein
3 the modeling step includes a triangular waveform modeling step
4 of modeling the instantaneous current as a triangular waveform
5 which has a given width and whose height is calculated from
6 each event information such that the amount of instantaneous
7 electric current becomes equal to the area of the triangular
8 waveform, and the FFT processing step includes a step of
9 subjecting to FFT processing information concerning a change
10 in current, the information being calculated in the triangular
11 waveform modeling step.

1 12. (original) The electromagnetic interference analysis
2 method as defined in claim 1, wherein the modeling step
3 includes a multi-order-function waveform modeling step of
4 modeling the instantaneous current as a multi-order function
5 waveform, and the FFT processing step includes a step of
6 subjecting to FFT processing information concerning a change
7 in current, the information being calculated in the multi-
8 order-function waveform modeling step.

1 13. (original) The electromagnetic interference analysis
2 method as defined in claim 1, wherein the modeling step
3 includes an exponential function waveform modeling step of
4 modeling the instantaneous current as an exponential-function
5 waveform, and the FFT processing step includes a step of
6 subjecting to FFT processing information concerning a change
7 in current, the information being calculated in the
8 exponential-function waveform modeling step.

1 14. (original) The electromagnetic interference analysis
2 method as defined in claim 1, wherein the modeling step
3 includes a step of modeling the amount of instantaneous
4 electric current while separating the same into a short
5 circuit electric current component and a charge current
6 component.

1 15. (previously presented) The electromagnetic
2 interference analysis method as defined in claim 1, wherein
3 the modeling step includes a calculation step of calculating
4 the height of a rectangular waveform from a library in which
5 peak currents of cells are characterized according to the type
6 of cell, and a rectangular waveform modeling step of modeling
7 the amount of instantaneous electric current as a rectangular
8 waveform, the peak current calculated in the calculation step

9 being taken as the height of the rectangular waveform and the
10 area of the rectangular waveform being equal to the amount of
11 electric current of each event, and the FFT processing step
12 includes a step of subjecting to FFT processing information
13 concerning a change in current, the information being
14 calculated in the rectangular waveform modeling step.

1 16. (original) The electromagnetic interference analysis
2 method as defined in claim 15, wherein the calculation step
3 includes a step of calculating a peak current for each cell
4 from information concerning a slew in the cell, by reference
5 to a library in which the relationship between a slew in input
6 waveform and a peak current is characterized in the form of a
7 table according to the type of cell.

8 17. (original) The electromagnetic interference analysis
9 method as defined in claim 15, wherein the calculation step
10 includes a step of calculating a peak current for each cell
11 from information concerning a load capacitance of a cell, by
12 reference to a library in which the relationship between a
13 load capacitance and a peak current is characterized in the
14 form of a table according to the type of cell.

15 18. (original) The electromagnetic interference analysis
16 method as defined in claim 15, wherein the calculation step
17 includes a step of setting a plurality of peak currents for a
18 composite cell and calculating the heights of a plurality of
19 rectangular waveforms through use of a characterized library,
20 and the rectangular waveform modeling step corresponds to a
21 step of modeling the amount of electric current into a
22 plurality of rectangular waveforms.

23 19. (original) The electromagnetic interference analysis
24 method as defined in claim 15, wherein the calculation step

25 includes a step of setting a plurality of peak currents for
26 each of the rise and fall of a flip-flop (FF) cell and
27 calculating the heights of a plurality of rectangular
28 waveforms through use of a characterized library, and the
29 rectangular waveform modeling step corresponds to a step of
30 modeling the amount of electric current into a plurality of
31 rectangular waveforms.

32 20. (original) The electromagnetic interference analysis
33 method as defined in claim 15 , wherein the calculation step
34 includes a step of calculating the height of a rectangular
35 waveform through use of a library in which peak currents are
36 characterized, in consideration of the state of an input
37 signal.

38 21. (original) The electromagnetic interference analysis
39 method as defined in claim 15, wherein the modeling step
40 includes a step of calculating a drop in voltage from the
41 amount of electric current determined according to the type of
42 cell and from the resistance of a power line; and a correction
43 step of characterizing, for each cell, the relationship
44 between a drop in voltage and the amount of instantaneous
45 electric current in the form of a table, to thereby correct
46 the amount of instantaneous electric current for each event of
47 the cell.

1 22. (original) The electromagnetic interference analysis
2 method as defined in claim 15, wherein the modeling step
3 includes a step of
4 calculating a drop in voltage from the amount of electric
5 current determined according to the type of cell,
6 the resistance of a power line, and the capacitance
7 of an on-chip capacitor; and

8 a correction step of characterizing, for each cell, the
9 relationship between a drop in voltage and the
10 amount of instantaneous electric current in the form
11 of a table, to thereby correct the amount of
12 instantaneous electric current for each event of the
13 cell.

1 23. (original) The electromagnetic interference analysis
2 method as defined in Claim 10, wherein the correction step
3 includes a step of iterating several times calculation of a
4 drop in voltage and correction of a current waveform.

1 24. (original) The electromagnetic interference analysis
2 method as defined in claim 15, wherein the calculation step
3 includes a step of modeling the amount of instantaneous
4 electric current while separating the same into a short
5 circuit electric current component and a charge current
6 component.

1 25. (previously presented) The electromagnetic
2 interference analysis method as defined in claim 1, wherein
3 the modeling step includes a triangular waveform modeling step
4 of modeling the instantaneous current as a triangular waveform
5 whose width is calculated from each event information in
6 consideration of slew information (i.e., an output slew) for
7 an output terminal of a cell for each event information such
8 that the area of the triangular waveform becomes equal to the
9 amount of electric current of each event, the height of the
10 triangular waveform being calculated on the basis of the
11 width, and the FFT processing step includes a step of
12 subjecting to FFT processing information concerning a change
13 in current, the information being calculated in the triangular
14 waveform modeling step.

1 26. (original) The electromagnetic interference analysis
2 method as defined in claim 1, wherein the modeling step
3 includes a triangular height calculation step of calculating
4 the height of a triangular waveform such that the area of the
5 triangular waveform becomes equal to the amount of electric
6 current of each event, by means of multiplying the amount of
7 instantaneous electric current by a coefficient corresponding
8 to the state of an event of a cell, in consideration of
9 whether the event of the cell is in a rising state or a
10 falling state.

1 27. (previously presented) The electromagnetic
2 interference analysis method as defined in claim 1, wherein
3 the modeling step includes a step of calculating the amount of
4 instantaneous electric current from each event information in
5 the case of a composite cell; and a triangular waveform
6 modeling step of modeling the amount of instantaneous electric
7 current as a plurality of triangular waveforms which are equal
8 in number to the stages provided in the composite cell,
9 through use of a table representing the relationship between
10 the width and height of a triangular waveform; and the FFT
11 processing step includes a step of subjecting to FFT
12 processing information concerning a change in current, the
13 information being calculated in the triangular waveform
14 modeling step.

1 28. (currently amended) An electromagnetic interference
2 analysis system for analyzing the amount of electromagnetic
3 interference arising in an LSI by means of performing a gate
4 level ~~logic~~ simulation, the system comprising:
5 a logic simulator;
6 computation means which is connected to the logic
7 simulator and calculates the amount of instantaneous

8 electric current from event information, the
9 information being produced when a change arises in a
10 signal and including the instance name of each cell
11 in which the change has arisen, the name of the
12 signal, a time at which the change has arisen, and
13 transition information;
14 ~~modeling~~ transforming means for ~~modeling~~ transforming
15 said instantaneous electric current amount into an
16 ~~the~~ instantaneous electric current according to a
17 predetermined rule related to said instantaneous
18 current amount; and
19 fast Fourier (FFT) conversion means for subjecting to
20 fast Fourier processing the information concerning a
21 change in electric current, the information being
22 calculated through the ~~modeling~~ transforming means,
23 thereby analyzing the amount of electromagnetic
24 interference arising in an LSI on the basis of a
25 signal output from the FFT conversion means.

1 29. (previously presented) The method of claim 1, further
2 comprising the step of providing a gate level logic
3 simulation.

1 30. (currently amended) The ~~method~~ system of claim 28,
2 further comprising a gate level logic simulator.